HORROCKS ENGINEERS

To: Mack Christensen, P.E.

From: Jayson Cluff, P.E.

Date: October 8, 2007

Memorandum

Subject: **Layton Interchange EIS - 750 South Phasing**

With the proposed Layton Interchange at Milepost 330, 750 South would initially be constructed only between Flint Street and Fort Lane. Layton City was concerned about when 750 South would be required west of Flint Street. Horrocks Engineers performed an analysis using the Wasatch Front Regional Council's (WFRC) travel demand model to determine the impacts to the adjacent streets without 750 South West of Flint Street. This memorandum briefly describes the methodology and findings of the analysis.

First, the model was run for 2006 using the Layton Interchange EIS subarea model to compare with existing traffic volumes. This information serves as a basis to determine how reliable the model is predicting traffic volumes in the Layton Interchange area. Table 1 summarizes the volumes.

Table 1: Comparison of WFRC 2006 Model and 2006 Traffic Counts

Street Section		Model	Count	Difference
From	To			
Gentile Street				
2200 West	Angel Street	8,100	9,800	-1,700
Angel Street	Sugar Street	15,160	14,000	1,160
Sugar Street	King Street	10,040	13,800	-3,760
King Street	Flint Street	14,590	13,800	790
Flint Street	Main Street	14,270	13,000	1,270
Main Street	Fort Lane	16,870	14,950	1,920
Flint Street				
Gentile Street	Weaver Lane	7,790	4,400	3,390
Weaver Lane	900 South	7,020	4,200	2,820
Main Street				
Church Street	Gentile Street	28,000	22,300	5,700
Gentile Street	I-15	19,500	20,200	-700
I-15	Fort Lane	12,320	13,900	-1,580
Fort Lane				
Lindsay Street	Gentile Street	6,300	8,100	-1,800
Gentile Street	Main Street	3,820	7,600	-3,780
900 South				
Flint Street	I-15	2,030	2,100	-70
I-15				
I-15 Southbound On-Ramp		7,440	5,700	1,740
I-15 Northbound Off-Ramp		7,020	8,600	-1,580

In general, Table 1 shows in most cases the model is predicting traffic to within a couple thousand vehicles per day. This suggests that the model is reliable for future traffic projections to within a range of plus-or-minus a couple thousand. It should be noted that overall, the average difference in volumes is only +240 vehicles. Thus, the model is predicting total traffic very well, but the distribution is slightly off. For example the model is over-predicting Flint Street and under-predicting Fort Lane.

It was assumed that the Layton Interchange construction would be completed by 2010. The model was run for two scenarios in 2010, with and without the interchange. Both scenarios excluded 750 South west of Flint Street, and they excluded the King Street extension. Table 2 shows the projected volumes for the two scenarios.

Table 2: Comparison of WFRC 2010 Model With and Without the Interchange

Street Section		Without Interchange	With Interchange	Difference
From	**To**			
Gentile Street				
2200 West	Angel Street	8,490	8,740	250
Angel Street	Sugar Street	15,820	14,430	-1,390
Sugar Street	King Street	10,290	9,670	-620
King Street	Flint Street	15,100	12,000	-3,100
Flint Street	Main Street	14,970	11,000	-3,970
Main Street	Fort Lane	17,870	13,040	-4,830
Flint Street				
Gentile Street	750 South	8,250	4,550	-3,700
750 South	900 South	8,100	11,420	3,320
Main Street				
Church Street	Gentile Street	30,380	27,270	-3,110
Gentile Street	I-15	21,400	20,270	-1,130
I-15	Fort Lane	13,030	-	-
Fort Lane				
Lindsay Street	Gentile Street	7,220	8,670	1,450
Gentile Street	750 South	4,620	14,680	10,060
750 South	Main Street	4,620	9,910	5,290
900 South				
Flint Street	I-15	2,130	-	-
I-15				
I-15 Southbound On-Ramp		8,530	10,100	1,570
I-15 Northbound Off-Ramp		8,140	10,380	2,240

As shown in Table 2, some notable changes occur in traffic patterns with the construction of the proposed Layton interchange. Compared with the no-build scenario, traffic volumes on Gentile Street will generally decrease. Traffic volumes on Flint Street north of 750 South are expected to decrease and south of 750 South will increase. Traffic volumes on Fort Lane are expected to increase significantly.

The LOS D threshold volume for a 3-Lane roadway is 13,700. This indicates that with the Layton interchange, Flint Street will still operate at LOS D or better, but Fort Lane may be approaching capacity. Fort Lane would likely need widening to a 5-Lane section sometime between 2010 and 2015.

The final analysis was performed for year 2020. This analysis included two scenarios, each with the proposed Layton Interchange. The difference was that one scenario assumed the North Legacy Parkway was constructed and the other scenario assumed the North Legacy Parkway was not constructed. Both scenarios excluded 750 South west of Flint Street, and they excluded the King Street extension. Flint Street was assumed to be a 5-lane section and Gentile Street East of Main Street was assumed to be a 5-lane section. Table 3 summarizes the results.

Table 3: Comparison of WFRC 2020 Model With and Without North Legacy Parkway

Street Section		Without Legacy	With Legacy	Difference
From	To			
Gentile Street				
2200 West	Angel Street	11,200	8,320	-2,880
Angel Street	Sugar Street	21,940	19,830	-2,110
Sugar Street	King Street	14,540	12,650	-1,890
King Street	Flint Street	17,880	15,800	-2,080
Flint Street	Main Street	14,400	12,750	-1,650
Main Street	Fort Lane	17,980	17,680	-300
Flint Street				
Gentile Street	750 South	8,860	8,300	-560
750 South	900 South	16,360	15,210	-1,150
Main Street				
Church Street	Gentile Street	33,520	31,630	-1,890
Gentile Street	I-15	24,060	20,880	-3,180
Fort Lane				
Lindsay Street	Gentile Street	12,530	12,060	-470
Gentile Street	750 South	16,960	16,980	20
750 South	Main Street	12,090	11,140	-950
I-15				
I-15 Southbound On-Ramp		10,160	9,410	-750
I-15 Northbound Off-Ramp		10,450	9,490	-960

As shown in Table 3, most of the Layton roadways will experience a decrease in traffic volumes with the construction of North Legacy Parkway. As far a 750 South west of Flint Street is concerned, the North Legacy Parkway will prolong its need for construction. However, even with North Legacy Parkway, the volumes shown in the table indicate that 750 South will be required by 2020.

In conclusion, the most critical roadway improvement that will be needed after the Layton Interchange construction will be Fort Lane widening to a 5-lane section. Depending on the timeline for other improvements such as the North Legacy Parkway, 750 South west of Flint Street will be required sometime between 2015 and 2020. This schedule will provide for adequate traffic operations for roadways near the proposed Layton Interchange.